

# Reaction of Red Clover and Birdsfoot Trefoil Cultivars and Germplasm to *Mycoleptodiscus terrestris*

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## Introduction

Soilborne plant pathogens are regarded as important causes of failures of newly established and mature stands of forage legumes in the North Central Region of the U.S. The fungus *Mycoleptodiscus terrestris* was recovered from decaying roots and stems of birdsfoot trefoil (*Lotus corniculatus* L.) and red clover (*Trifolium pratense* L.) plants sampled from two-year-old plants in 1994. Although recognized in states south of Wisconsin, *Mycoleptodiscus terrestris* has not been implicated in poor health of forage legumes in Wisconsin. *M. terrestris* has been previously reported to be pathogenic on alfalfa, red clover and birdsfoot trefoil in Illinois. The fungus has been reported to be pathogenic on birdsfoot trefoil in Missouri and eastern U.S. Only the trefoil cultivar Dawn and the germplasm CAD have been reported to have some degree of resistance (tolerance) to *M. terrestris*. However, no resistance has been identified in red clover or birdsfoot trefoil germplasm adapted to the northern area of the midwest. Forage legume germplasm has not been characterized extensively for reaction to *M. terrestris*. The objective of this research was to evaluate a select set of cultivars and germplasm populations of red clover and birdsfoot trefoil for their reaction to *M. terrestris*.

## Materials and Methods

Three-week-old seedlings of selected cultivars and germplasm of red clover and birdsfoot trefoil were

inoculated with a mycelium/sclerotium suspension (one 100 mm standard plate/1 water) as a drench at a rate of 20 ml per 10 seedlings and incubated for three weeks at 25°C. Six-week old seedlings were evaluated for reaction to the respective isolates on a scale of 1 to 5; 1 = no symptoms and 5 = a dead plant.

## Results

Significant differences were observed among the 18 birdsfoot trefoil cultivars and germplasm populations evaluated for their response to *M. terrestris* (Table 1). The broad-based cultivar, Norcen, was one of the least susceptible cultivars and AUDewey, selected in Alabama, was the most susceptible. Both the cultivar Dawn and the germplasm CAD were among the more resistant populations. The range between the percent plants in the different DSI classes would suggest that genetic variability does exist for the development of highly resistant germplasm. All red clover cultivars and germplasm populations were quite susceptible to *M. terrestris* (Table 2). On the average, only 15% of the plants were scored in the DSI class of 1 or 2, but this should be sufficient to provide a source for developing resistant germplasm.

Table 1. Response of birdsfoot trefoil cultivars and germplasm to *Mycoleptodiscus terrestris*.

Entry name	Origin	Percent plants with DSI* of			Mean DSI**
		1 & 2's	3's	4 & 5's	
NORCEN	Nor. Cent.	49	22	29	2.83 a
EMPIRE	New York	43	24	33	2.85 ab
DAWN	Missouri	41	24	35	2.96 abc
MACKINAW	Michigan	40	24	36	3.02 abcd
FERGUS	Kentucky	43	21	36	3.03 abcd
CAD	Missouri	41	20	39	3.07 abcd
VIKING	New York	38	26	36	3.10 abcd
WITT	Wisconsin Gp	37	24	39	3.16 bcd
ARS2620	Missouri	33	30	37	3.12 cd
BONNIE	France	35	22	43	3.23 cd
CARROLL	Iowa	35	23	42	3.24 cde
LEO	Canada	39	18	43	3.26 cde
MU81	Missouri	31	21	48	3.36 cde
MAITLAND	Canada	27	30	43	3.38 cde
TREVIG	Wisconsin GP	30	21	49	3.43 de
BULL	Canada	30	21	49	3.48 de
GEORG 1	Georgia	25	25	50	3.52 de
AUDEWEY	Alabama	21	14	65	3.88 e
All Entries		34	23	33	3.22

\*DSI = Disease Severity Index: 1 = healthy plant, 5 = dead plant.

\*\*Average of 275 plants per entry were challenged and entries followed by the same letter are not significantly different at the 5% level.

Note: Coefficient of Variation was 9.5%.

Table 2. Response of red clover cultivars and germplasm to *Mycoleptodiscus terrestris*.

Entry name	Origin	Percent plants with DSI* of			Mean DSI**
		1 & 2's	3's	4 & 5's	
CONCORD	ABI	22	19	59	3.55
LAKELAND	ARS/Wisconsin	19	26	56	3.58
FGRK01	Forage Gen.	21	18	61	3.64
NY9311	New York	14	28	58	3.67
SCARLETT	Dairyland	15	26	59	3.68
C182	ARS/Wis Exp.	20	21	60	3.69
KENSTAR	Kentucky	16	29	55	3.72
FGR03	Forage Gen.	13	25	62	3.74
WI-1	ARS/Wis GP	19	20	60	3.74
CINNAMON	Farmers For. Res	16	26	58	3.76
ACCLAIM	Allied	14	21	65	3.76
W87A	Northrup-King	17	20	63	3.76
RANDOLPH	Allied	15	22	64	3.82
C328	ARS/Wis Exp.	15	19	65	3.89
ARLINGTON	ARS/Wisconsin	9	21	69	3.93
COMMON	ARS/Wisconsin	16	23	61	4.00
WI-2	ARS/Wis Gp	11	20	69	4.04
MARATHON	ARS/Wisconsin	8	10	82	4.27
All Entries		15	22	63	3.79

\*DSI = Disease Severity Index: 1 = healthy plant, 5 = dead plant.

\*\*Average of 120 plants per entry were challenged.

Note: Coefficient of Variation was 10.4% and differences between entries was not significant.